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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/613,549	07/02/2003	David R. Hall	66.0034	6689

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EXAMINER	
YACOB, SISAY	

ART UNIT	PAPER NUMBER
2612	

DATE MAILED: 09/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/613,549	HALL ET AL.	
	Examiner	Art Unit	
	Sisay Yacob	2612	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 July 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1 This communication is in response to applicant's amendment, which was filed July 12, 2006.

2 Arguments to pending claims 1-20 have been entered and made of record in the application of Hall et al., "Link module for a downhole drilling network " filed on July 02, 2003.

Claims 1-20 are pending.

Response to Arguments

3 Applicant's arguments in the remarks on pages 2-3, filed on July 12, 2006, with respect to pending claims 1-20 have been fully considered and are persuasive. The first non-final office action of April 17, 2006 has been withdrawn because of the prior art of Pacault U.S. Patent (6,950,034) fails to qualify as a prior art due to having a priority date of August 29, 2003 while the present application has a priority date of July 2, 2003.

Rejections - 35 USC § 103

4 The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5 The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6 Claims 1-7, 14-18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over the US publication of Hughes (20030213598) in view of US patent of Martin (3,186,222).

7 As to claim 1, Hughes discloses a downhole assembly comprising a cylindrical housing characterized by a proximal end and a distal end, having a substantially cylindrical wall, the cylindrical wall defining a central bore passing there through (Page 3, Par. 0032; Page 5, Claim 1, lines 1-5; Item 200 of figure 2), the cylindrical housing further formed to define at least one recess in the cylindrical wall (Page 5, Claim 1, lines 6-8; Items 244 and 264 of figure 2), a cylindrical housing (Items 22 and 32 of figures 2 and 3) comprising an annular recess formed into at least one of the proximal end and the distal end (Item 25 of figures 2 and 3), and an annular transmission element (Item 26 of figures 2 and 3) located in the annular recess. However, Hughes does not

expressly disclose the downhole assembly being a repeater assembly, a repeater circuit located within the at least one recess, and the annular transmission element operably connected to the repeater. In the field of well signaling system, Martin discloses a downhole assembly with annular recess formed into at least one of the proximal end and the distal end, and an annular transmission element located in the annular recess, and the repeater circuit located within the at least one recess (Col. 10, lines 37-75; Col. 11, lines 1-8; See figures 1, and 9).

It would have been obvious, to one of ordinary skill in the art, at the time of the invention, to modify the downhole assembly of Hughes, by incorporating a downhole repeater module, as disclosed by Martin, in order to have a downhole repeater assembly comprising a cylindrical housing, characterized by a proximal end and a distal end, having a substantially cylindrical wall, the cylindrical wall defining a central bore passing therethrough, the cylindrical housing further formed to define at least one recess in the cylindrical wall, a repeater circuit located within the at least one recess, the cylindrical housing further comprising an annular recess formed into at least one of the proximal end and the distal end, and an annular transmission element located in the annular recess, the annular transmission element operably connected to the repeater, because Hughes discloses a downhole assembly comprising a cylindrical housing characterized by a proximal end and a distal end, the cylindrical wall defining a central bore passing therethrough, the cylindrical housing further formed to define at least one recess in the cylindrical wall for communication elements and Martin discloses a downhole assembly that include a repeater incorporated in the drill string cylindrical

housing comprising an annular recess formed, and an annular transmission element located in the annular recess.

8 As to claim 2, the downhole repeater assembly of claim 1, further, Hughes discloses a first channel, formed within the cylindrical housing, extending from the at least one recess to at least one of the proximal and distal end (Page 5, Claim 1, lines 6-8; Item 244 of figure 2).

9 As to claim 3, the downhole repeater assembly of claim 1, further, Hughes discloses wherein the annular transmission element inductively converts electrical energy to magnetic energy (Page 2, Par. 0010, lines 20-24; Items 224 and 264 of figure 2).

10 As to claim 4, the downhole repeater assembly of claim 1, further, Hughes discloses wherein the annular transmission element comprises an electrical contact to transmit electrical energy directly to another contact (Page 2, Par. 0010, lines 20-24; Items 224 and 264 of figure 2).

11 As to claim 5, the downhole repeater assembly of claim 1, further, Martin discloses at least one battery located in the at least one recess (Col. 10, lines 31-33).

12 As to claim 6, the downhole repeater assembly of claim 1, further, Hughes discloses wherein the cylindrical housing is inserted into the bore of a host downhole tool (Page 3, Par. 0032, lines 1-3; Item 200 of figures 2, 3 and 10 and 12) and the host downhole tool further comprises a pin end and a box end (Items 120 and 300 of figure 5), the pin end having an external threaded portion and the box end having an internal threaded portion (Items 122 and 304 of figure 3, 5, 8, 9A-B, 10, 12 and 13).

13 As to claim 7, the downhole repeater assembly of claim 6, further, Hughes discloses wherein the box end lacks an integrated secondary shoulder (Items 120 and 160 of figures 1 and 3).

14 As to claim 14, Hughes discloses a downhole module comprising a cylindrical housing, characterized by a proximal end and a distal end, having a substantially cylindrical wall, the cylindrical wall defining a central bore passing therethrough (Page 3, Par. 0032; Page 5, Claim 1, lines 1-5; Item 200 of figure 2), the cylindrical housing further formed to define at least one recess in the cylindrical wall (Page 5, Claim 1, lines 6-8; Items 244 and 264 of figure 2), however, Hughes does not expressly disclose the downhole module being a repeater module, a repeater circuit located within the at least one recess, and a data acquisition circuit located within the at least one recess, connected to the repeater circuit, to acquire data from at least one sensor. Martin discloses a downhole module with annular recess formed into at least one of the proximal end and the distal end, a repeater circuit located within the downhole module

(See figure 1), and a data acquisition circuit located within the downhole module, connected to the repeater circuit, to acquire data from at least one sensor and an annular transmission element located in the annular recess that may incorporate repeater module (Col. 10, lines 37-75; Col. 11, lines 1-8; See figures 1, and 9).

It would have been obvious, to one of ordinary skill in the art, at the time of the invention, to modify the downhole assembly of Hughes, by incorporating a downhole module comprising, as disclosed by Martin, in order to have a downhole module comprising a cylindrical housing, characterized by a proximal end and a distal end, having a substantially cylindrical wall, the cylindrical wall defining a central bore passing therethrough, the cylindrical housing further formed to define at least one recess in the cylindrical wall, a repeater circuit located within the at least one recess; and a data acquisition circuit located within the at least one recess, connected to the repeater circuit, to acquire data from at least one sensor, because Hughes discloses a downhole assembly comprising a cylindrical housing characterized by a proximal end and a distal end, having a substantially cylindrical wall, the cylindrical wall defining a central bore passing therethrough, the cylindrical housing further formed to define at least one recess in the cylindrical wall and Martin discloses a downhole module comprising a repeater module, a repeater circuit located within the at least one recess, and a data acquisition circuit located within the at least one recess, connected to the repeater circuit, to acquire data from at least one sensor.

15 As to claim 15, the downhole module of claim 14, further, Martin discloses an uphole data link extending from the repeater circuit to the proximal end, and a downhole data link extending from the repeater circuit to the distal end (See figure 1).

16 As to claim 16, the downhole module of claim 14, further, Hughes discloses wherein the cylindrical housing is characterized by at least one annular recess formed into at least one of the proximal end and the distal end (Page 5, Claim 1, lines 6-8; Item 244 of figure 2).

17 As to claim 17, the downhole module of claim 16, further, Martin discloses wherein the cylindrical housing further comprises an annular transmission element located in the annular recess (Col. 10, lines 37-57; See figure 9).

18 As to claim 18, the downhole module of claim 14, further, Martin discloses at least one battery located in the at least one recess (Col. 10, lines 31-33).

19 As to claim 20, Hughes discloses a downhole assembly comprising a cylindrical housing, characterized by a proximal end and a distal end, having a substantially cylindrical wall, the cylindrical wall defining a central bore passing therethrough (Page 3, Par. 0032; Page 5, Claim 1, lines 1-5; Item 200 of figure 2), the cylindrical housing having at least one recess formed into the outer rounded surface of the cylindrical wall (Page 5, Claim 1, lines 6-8; Items 244 and 264 of figure 2). However, Hughes does not

expressly disclose the downhole assembly being a repeater assembly, and a signal repeater located within the at least one recess. Martin discloses a downhole repeater assembly comprising a signal repeater located within the at least one recess (Col. 10, lines 37-75; Col. 11, lines 1-8; See figures 1, and 9).

It would have been obvious, to one of ordinary skill in the art, at the time of the invention, to modify the downhole assembly of Hughes, by incorporating a downhole assembly, as disclosed by Martin, in order to have a downhole repeater assembly comprising a cylindrical housing, characterized by a proximal end and a distal end, having a substantially cylindrical wall, the cylindrical wall defining a central bore passing therethrough, the cylindrical housing having at least one recess formed into the outer rounded surface of the cylindrical wall, and a signal repeater located within the at least one recess, because Hughes discloses a downhole assembly comprising a cylindrical housing characterized by a proximal end and a distal end, having a substantially cylindrical wall, the cylindrical wall defining a central bore passing therethrough, the cylindrical housing further formed to define at least one recess in the cylindrical wall and Martin discloses a downhole assembly that include a repeater incorporated in the drill string cylindrical housing comprising an annular recess formed, and a signal repeater located within the at least one recess.

20 Claims 8, 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hughes in view of Martin and further in view of US publication of Allamon et al., (20020061224).

21 As to claim 8, the downhole repeater assembly of claim 7, however, the combination of Hughes and Martin does not expressly disclose a secondary shoulder insert inserted into the box end, independent from the box end, capable of absorbing stresses normally incident on an integrated secondary shoulder. In the field apparatus for holding pipe or other tubular members in a vertical position, and increases the strength of drill pipe slip assemblies, Allamon et al., discloses a secondary shoulder insert inserted into the drill string, independent from the upper and lower components that is capable of absorbing stresses (Page 1, Par. 0010, lines 1-7; Page 3, Par. 00370, lines 1-14; Item 14 of figures 2 and 6A-B).

It would have been obvious, to one of ordinary skill in the art, at the time of the invention, to modify the combination of Hughes and Martin, by incorporating a secondary shoulder insert inserted into the drill string, as disclosed by Allamon et al., in order to have a downhole repeater assembly comprising a secondary shoulder insert inserted into the box end, independent from the box end, capable of absorbing stresses normally incident on an integrated secondary shoulder, because Hughes and Martin disclose a downhole repeater assembly comprising, a cylindrical housing comprising an annular recess formed into at least one of the proximal end and the distal end, and an annular transmission element located in the annular recess and Allamon et al., discloses a downhole assembly comprising a secondary shoulder insert inserted into the drill string, independent from the upper and lower components that is capable of absorbing stresses.

22 As to claim 9, the downhole repeater assembly of claim 8, further, Hughes discloses wherein stresses normally incident on a secondary shoulder are not imposed on the cylindrical housing (Page 4, Par. 0035, lines 20-37).

23 As to claim 10, the downhole repeater assembly of claim 8, further, Hughes discloses wherein surface characteristics of the secondary shoulder insert engage corresponding surface characteristics of the inside diameter of the host tool to transfer a load, incident on the secondary shoulder insert, to the host tool (Page 4, Par. 0035, lines 20-37).

24 Claims 11, 12 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hughes in view of Martin and further in view of US patent of Montgomery et al., (5,166,908).

25 As to claim 11, the downhole repeater assembly of claim 1, however, the combination of Hughes and Martin does not expressly disclose wherein the repeater circuit further comprises a data acquisition circuit to acquire data from at least one sensor. In the data transmission and method field of endeavor, Montgomery et al., discloses a downhole repeater module comprising repeater circuit further comprises a data acquisition circuit to acquire data from at least one sensor (Col. 7, lines 22-41).

It would have been obvious, to one of ordinary skill in the art, at the time of the invention, to modify the combination of Hughes and Martin, by incorporating a downhole

repeater module comprising data acquisition circuit to acquire data from at least one sensor, as disclosed by Montgomery et al., in order to have a downhole module comprising a data acquisition circuit to acquire data from at least one sensor, because Hughes and Martin disclose a downhole module comprising a cylindrical housing comprising an annular recess formed into at least one of the proximal end and the distal end, and an annular transmission element located in the annular recess and Montgomery et al., discloses a downhole module comprising a data acquisition circuit to acquire data from at least one sensor.

26 As to claim 12, the downhole repeater assembly of claim 11, further, Montgomery et al., wherein the at least one sensor is selected from the group consist of a pressure transducer, an inclinometer, a thermocoupler, an accelerometer, an imaging device, and a seismic device (Col. 7, lines 15-41).

26 As to claim 19, the downhole module of claim 14, however, the combination of Hughes and Martin does not expressly disclose wherein the at least one sensor is selected from the group consisting of a pressure transducer, an inclinometer, a thermocoupler, an accelerometer, an imaging device, and a seismic device. In the data transmission and method field of endeavor, Montgomery et al., discloses a downhole repeater module comprising at least one sensor that is selected from the group consisting of a pressure transducer and an accelerometer, and a seismic device a sensor (Col. 7, lines 15-41).

It would have been obvious, to one of ordinary skill in the art, at the time of the invention, to modify the combination of Hughes and Martin by incorporating a downhole repeater module comprising at least one sensor, as disclosed by Montgomery et al., in order to have a downhole module comprising at least one sensor is selected from the group consisting of a pressure transducer, an inclinometer, a thermocoupler, an accelerometer, an imaging device, and a seismic device, because Hughes and Martin disclose a downhole module comprising a cylindrical housing comprising an annular recess formed into at least one of the proximal end and the distal end, and an annular transmission element located in the annular recess and Montgomery et al., discloses a downhole repeater module comprising at least one sensor that is selected from the group consisting of a pressure transducer and an accelerometer, and a seismic device a sensor.

27 Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hughes in view of Martin and further in view of Montgomery et al., and further in view of US publication of Koro (20030102980).

28 As to claim 13, the downhole repeater assembly of claim 1, however, the combination of Hughes, Martin and Montgomery et al., does not expressly disclose wherein the repeater circuit further includes components selected from the group consisting of signal filtering circuitry, signal error checking circuitry, device control circuitry, a modem, a digital signal processor, and a microcontroller. In a system,

method, and a signal repeater device for transmitting signals along a drill pipe field of endeavor, Koro discloses a repeater circuit further includes components selected from the group consisting of signal filtering circuitry, signal error checking circuitry, device control circuitry, a modem, a digital signal processor, and a microcontroller (Pages 6-7, Par. 0076; See figure 1).

It would have been obvious, to one of ordinary skill in the art, at the time of the invention, to modify the combination of Hughes, Martin and Montgomery et al., by incorporating a downhole module a repeater circuit further includes components selected from the group consisting of signal filtering circuitry, signal error checking circuitry, device control circuitry, a modem, a digital signal processor, and a microcontroller, as disclosed by Koro, in order to have a downhole module comprising wherein the repeater circuit further includes components selected from the group consisting of signal filtering circuitry, signal error checking circuitry, device control circuitry, a modem, a digital signal processor, and a microcontroller, because Hughes, Martin and Montgomery et al., disclose a downhole module comprising a cylindrical housing comprising an annular recess formed into at least one of the proximal end and the distal end, and an annular transmission element located in the annular recess and a data acquisition circuit to acquire data from at least one sensor and Koro discloses a downhole module comprising wherein the repeater circuit further includes components selected from the group consisting of signal filtering circuitry, signal error checking circuitry, device control circuitry, a modem, a digital signal processor, and a microcontroller.

Conclusion

29 The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following cited arts are further to show the sate of art related to link module for a downhole-drilling network.

30 In the US patent of (4,605,268) Meador discloses apparatus and method for coupling conductors carrying electronic signals, and finds particular application in the connection of cable segments mounted in pipe members wherein the individual cable segments are coupled at the pipe joints.

31 In the US patent of (6,688,396) Floerke et al., discloses system and method for a well borehole into the formation using a drilling system. The system typically comprises a drill bit carried at an end of a drill string. The drill string is comprised of a tubing which may be drill pipe made of jointed sections or a continuous coiled tubing and a drilling assembly that has a drill bit at its bottom end.

32 In the US patent of (6,364,017) Stout et al., discloses a repeater assembly that is imbedded in annular drill string for a single trip perforate and gravel pack system.

34 Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sisay Yacob whose telephone number is (571) 272-

8562. The examiner can normally be reached on Monday through Friday 8:00 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffery A. Hofsass can be reached on (571) 272-2981. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Sisay Yacob

9/13/2006

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